NEW INFRASTRUCTURE FOR

NEW NUCLEAR POWER PLANTS

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U.S. Nuclear Regulatory Commission

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[TITLE SLIDE] Good afternoon. It is a pleasure to be here and have the opportunity to address you again at INPO's CEO Conference. I would like to thank INPO for their kind invitation and their hospitality. Also participating at this meeting are NRC Commissioners Merrifield, Jaczko, and Lyons, as well as NRC's EDO, Luis Reyes and Regional Administrators Bill Travers and Jim Caldwell. You can direct any difficult questions to them.

It has been my privilege to attend this conference for 10 consecutive years, not a record but a good run. During that time, I have witnessed the positive transformation in the performance of the NRC and the nuclear industry. These performances, and specifically the licensees' interrelated safety and reliability performance, have been instrumental in establishing the necessary platform for increased public acceptance of nuclear energy, and for the support expressed for it by the President and the Congress of the United States. [SLIDES 2 and 3]

At the potential cost of showing my years – of experience, that is – I would like to state that the NRC is a stronger and better agency, that I believe the industry is also stronger and better, and our nation continues to get stronger and better. Challenged, yes, but stronger. The nuclear industry and the NRC have key roles to play in ensuring the continuing strength and improvement in the nation's energy security and well being. The roles are changing, and changing fast; moving from a perennial defensive position to a front line opportunity to maintain and enhance energy security, and indeed, the security and well-being of the nation. We should welcome the new roles and the opportunity, but, as the saying goes, be careful what you ask for .... With the passage of the Energy Policy Act of 2005 and other key factors in place, it appears that the game plan for potential new reactor licensing applications is being set. The next two slides summarize some factors influencing the prospects of constructing nuclear power plants:

[SLIDE 4] Factors positively influencing the prospects of constructing new nuclear power plants:

- Support by the President and the Congress for expanding the use of nuclear power, including incentives for the first six plants
- Concerns with the Nation's energy security
- High cost of oil and natural gas
- Environmental considerations
- Low and stable electrical production costs from nuclear
- Low interest rates and inflation
- Renewed interest by utilities in building new nuclear power plants
- NRC's establishment of an improved licensing process

[SLIDE 5] Factors with potential negative influence on the prospects of constructing new nuclear power plants:

- High capital cost of new nuclear power plants
- Financing considerations
- New licensing processes have not yet been fully tested

[SLIDE 6] The potential is large and the tasks are sobering. There is a need for a new infrastructure for new nuclear power plants that includes:

- Improved environmental assessments
- Improved techno-legal framework
- Improved reactor design and construction

Reliable suppliers
Well-qualified personnel

I am going to focus my comments this afternoon on the licensing process and the needed infrastructure, and the connectivity between them, with emphasis on the NRC role. Before I go any further, I want to clearly set where the NRC is today, regarding its key role, in the nation's energy security. In 1997, the NRC's Strategic Plan stated – [SLIDE 7]

> NRC's mission is to regulate the Nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of the public health and safety, to promote the common defense and security, and to protect the environment.

In 2004, the NRC's Strategic Plan stated that the NRC's mission is to –- [SLIDE 8] License and regulate the Nation's civilian use .... to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment.

The addition of the word "license" derives directly from the NRC's statutory responsibility to review and decide, in a timely fashion, applications for licenses, and to grant the applications if the requisite health, safety, security, and environmental standards are met, and to deny them if they are not. Furthermore, NRC's Strategic Plan for 2004 – 2009 includes one Strategic Objective [SLIDE 9]:

> Enable the use and management of radioactive materials and nuclear fuels for beneficial civilian purposes in a manner that protects public health and safety and the environment, promotes the security of our nation, and provides for regulatory actions that are open, effective, efficient, realistic, and timely.

This is a profound and challenging objective that reflects the NRC's statutory responsibilities. On a personal note, it represents most of what I have tried to achieve during my tenure as Commissioner and then Chairman of the United States Nuclear Regulatory Commission.

I could talk for a while about the meaning of the word "enable;" it is a catchy and very complex word. In fact, I recently have been spending a significant amount of time discussing its full meaning with the senior managers of the agency, in the context of the Strategic Objective. Instead, I am going to turn the tables on the nuclear industry and show one example of how you have enabled and should continue to enable the use of nuclear energy for beneficial civilian purposes, in a manner that protects public health and safety, common defense and security, and the environment.

Last year, I talked to you about "Excellence in Safety Management," and in particular about Unplanned Reactor Shutdowns of more than 6 months duration [Slide 10]. Congratulations, you have managed well the country's nuclear fleet. The average for extended plant shutdowns of over six months has decreased from about six per year for the period of 1979 to 1997 to about one per year since then. I have frequently stressed the contribution of safety to reliability, and vice versa. I believe the improved performance has also resulted in enhanced safety as well as reliability. I am sure that major, additional impacts can be surmised from every period of performance shown on this figure.

As demonstrated by the unplanned extended shutdown issue, the challenge faced by the nuclear industry and by the NRC in the upcoming years is far broader and deeper than new reactor licencing and its infrastructure. A necessary enabler of new reactor licensing is continuing safety and reliability of operating nuclear power plants. Excellence in operations is an enabler, and I appreciate INPO's contributions in this regard. Excellence in safety, security, and preparedness is an enabler. Excellence in applications for license renewals, power uprates, and license amendments is an enabler. Better, wider use of risk-informed and performance-based PRAs for design, operation, and maintenance, is an enabler. We should enable the capabilities of the new generation of managers and practitioners to effectively perform their duties. And, last but not least, to enable the licensing of new reactors, the industry needs to submit for the docket, high quality, complete, indeed excellent, thoughtfully assembled applications that clearly conform to the regulations and are fully supported by the vendor, architect/engineer, constructor, and supplier (i.e., the complete infrastructure). The NRC will then be able to do its job, in accordance with the quoted strategic objective. All these and more need to be done well. There is an old saying, often overused but dramatic, that may fit the present situation: "Failure is not an option."

The potential deployment of new nuclear power plants comes after a long hiatus in nuclear power plant licensing and construction. The lack of predictable financing, electric demand, design, construction, and regulation resulted in the long delays or cancellations of the 70's and 80's. There should be at least one good result from that experience: everyone today should be better prepared. There is no forgiveness in this business; expect none, for you will get none. However, there are rewards for anticipation, for preparation, and for simplicity. Simplicity is the mother of wisdom and the grandmother of achievement.

The entire nuclear business is different and still changing and no one should underestimate the difficulty in successfully engaging it in the construction mode. However, everyone today knows better, and should be able to execute better. Yet, it has been difficult to establish where are the horses in relationship to the carriage. Just a few years ago, the vendors were ahead of the utilities, with three banked standard certified designs. There were no buyers. There now appears to be a significant expression of interest from utilities, specifically in three reactor designs that are not yet completed for use in a COL [SLIDE 11]. A regulatory note: the governing technical rule for standard certified designs is 10 CFR 52.47. It requires that an evolutionary design, like the EPR, provide an essentially complete design prior to certification. For reactor designs with simplified, inherent passive or other means to accomplish their safety functions, like the AP 1000 and the ESBWR, the scope of the design must be complete and the applicant must demonstrate the performance of safety functions. [SLIDE 12] Either way, at COL application time, it will be highly desirable that you submit the complete safety case, ready for rigorous review, and ultimately for hearing. A standard certified design, with a complete rulemaking, has definite advantages. On the other hand, there is much good to be said about an essentially complete design. There is also much good to be said about a COL application supported by an adjudicated Early Site Permit and a Standard Certified Design by rulemaking. I fully understand that Part 52 permits different schemes for a COL, yet there is something to be said for simplicity. I believe that – [SLIDE 13]

Expectations and Permutations
are often not a good
Combination

That having been said, assuming the submission of a top-notch COL application, with an approved site and certified design, that clearly meets all regulatory requirements, the current estimated time from application to a decision on a COL, including adjudication, is about three years. [SLIDE 14] Assuming that the inspections, tests, analyses, and acceptance criteria (ITAAC) specified in the COL are satisfied during and on completion of construction, the time for construction, ITAACs, fuel loading, and initial operations is currently estimated to be about five years, for a total time estimate of eight years from COL application to initial operation.

I proposed that the need to continue doing all we are used to doing well is now challenged by having to do all we are going to have to do very soon, very well. I believe the NRC needs to, and you need to, recognize that –

- the challenge to be faced is likely to be more complicated than originally presumed;
- there is a need to stay ahead of the curve to meet external and internal expectations;
- the ability to recognize problems and the flexibility to address them promptly as they occur is essential; and,
- available resources must be used wisely and new resources must be sought when needed.

You will notice that all four of the conclusions imply that a successful outcome to a major challenge requires careful and complete preparation, the ability to perceive the challenge from a complete perspective, and the ability to bring the needed resources to bear on resolution in a timely manner.

Let me summarize for you some of my own views and concerns:

- I envision the next few years as posing the most serious challenge the NRC and the industry have faced in a generation, a “rising tide” of new responsibilities and difficult decisions that cover a wide spectrum of activities. Not the least of these is the potential necessity to resume new licensing activities after a long hiatus, with a new set of rules, players, reactors, construction methods, infrastructure, and high national demands.

- The NRC and the industry are more experienced with adjusting to downsizing and tight budgets than we are with expanding projects and resources. The preparation necessary to do more with less is quite different than preparing to do much more with more.

- Success in this context requires increased attention and sensitivity to external expectations, which are and will remain extremely high and extend across the board to the public, industry, the Congress, and the world – everyone will be watching and judging our actions. NRC will expect high quality and that schedules be followed. Industry will expect that NRC timetables will be met. The public will demand enhanced safety and must receive broad access to the decision-making process. Congress will expect all of this, and accountability.

- The NRC and the industry have made and will continue to make a number of necessary changes to address key issues, including the integration of existing reactors’ safety, security, and emergency preparedness, and to address early the safety/security

interface for new reactors. Everyone must ensure that these new frameworks will work as they should in the new, changed environment and must be willing to made additional changes should they prove necessary.

- The NRC is not a technical agency. It is a techno-legal agency. It must realize, internalize, and act according to that fact. The nuclear industry must also pay close attention to the techno-legal interface. The techno-legal interface is a key to doing the job right; it has to be transparent, and yes, managed.

- The NRC and the industry will face the new challenges that lie ahead with the largest increment of new staff and new managers that has been required in some time.
- Effective communications, internal and external, is being raised to a new level; everyone is affected.

- Everyone must live up to the standards that are required.

Someone told me the other day: the train is leaving the station. [SLIDE 15] I asked of myself and the NRC staff, and maybe you should ask yourself:

If the train is leaving the station,
Am I on it?
Do I know where it is going?
Do I know what to do once I am on the train?
Do I know if everybody on the train knows what they should do?
Do I have the plan, the tools, the resources I will need to get it to its destination?
Do I and everyone else know what to expect during the trip?
Do I know what to do when it gets to its final destination?

The Nuclear Regulatory Commission realizes that we have to anticipate, define, prepare, and execute at a different level. We are going to keep doing well all the things we do well, day in and day out, but we are going to be better at managing the new and the different, the one or two of a kind, the first, and then the second, and so on, and so on. We are going to pay special attention to the techno-legal interface, internally and externally, because they have to march forward together. I cannot emphasize enough the importance that this interface has for everyone that is going to be involved in new nuclear power plant construction.

At the beginning of my talk, I mentioned the Energy Policy Act, the NRC mission, and the new Strategic Objective, which is indeed a governing objective. I am going to articulate a high and viable goal for the NRC that captures all of the above in one measurable outcome:

Use of the Energy Policy Act's risk insurance program should not be the consequence of NRC fault in the thoroughness and timeliness of its review.

I am sure you realize I am placing the burden on you. If you come to the NRC with a COL application, it should have one requisite ultimate quality: the safety case and other required components are of such excellence that the application can pass the tests of staff review, NRC hearing, and courts of law. Anything less lacks the predictability the nation expects and many demand.

On a final note, I believe you should know that I am an optimist, and that I am very encouraged by the seriousness of the energy debate and the solutions that our country is adopting and considering to secure our energy future. The fact that my many scars are reacting to the weather front should be food for thought, and, I hope, action. I am convinced that the NRC and the nuclear industry have the capability to respond to the challenges ahead.

Thank you.